

NOTES ON THE EUCALYPTS OF THE BLUE  
MOUNTAINS.

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We have botanically explored the Blue Mountains for many years, but the part more particularly dealt with in this paper is that near the Main Western Road and extending from Emu Plains to Eskbank. Recently we walked leisurely over the Blue Mountains from Penrith. We have also recently explored the Cox's River on Allan Cunningham's tracks, and, for the purpose of making specific observations, we spent three weeks in collecting material for this paper, with Blackheath for a centre. We believe that no list of the Eucalypts of the Blue Mountains has hitherto been published. The summer of 1904-5 will be remembered by us as the best season for obtaining seedlings and sucker foliage of Eucalypts that has presented itself for a number of years. This was in consequence, in part, of the exceptionally dry spring. The descriptions of the seedlings were drawn up from living specimens in the field, and most of them are new. Except on the lower parts of the mountains east of Springwood, there are neither Box nor Ironbark trees, as both avoid cold country; and it may be mentioned that none of them occur in Tasmania. *E. coriacea*, A. Cunn., is also a notable absentee from the Blue Mountains proper.\*

We desire to invite attention to our observations on possible *Eucalyptus* hybrids.

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\* *E. coriacea* has been recorded from Mount Wilson by Rev. Dr. Woolls (these Proceedings, 1887, p. 6), and also by Mr. A. G. Hamilton (these Proceedings, 1899, p. 358), but we have not collected it.

1. *EUCALYPTUS MOOREI*, sp. nov.

Syn. *E. stellulata*, Sieb., var. *angustifolia*, Benth., B.Fl. iii. 201. See also further synonymy in Maiden's 'Critical Revision of the Genus Eucalyptus,' v. 129, together with figs. 5a, 5b and 6 of Plate 25.

An erect, rather slender shrub of up to 10 or 12 feet in height, with a stem diameter of 2 to 4 inches. It forms dense masses of small area, reminding one somewhat of a whipstick Mallee, but lacking the root stockiness of that form of Eucalyptus growth.

*Juvenile leaves* narrow-lanceolate, glaucous blue, the plant sometimes flowering while still in the opposite-leaved stage. Leaves profusely dotted with oil glands.

*Mature leaves*.—"Leaves narrow, very thick and smooth, scarcely showing the venation" (Benth.). Shiny on both sides; the tips of the leaves often hooked.

*Buds* arranged in stellate clusters with longish sharply pointed opercula. Opercula sometimes red in fresh specimens.

*Flowers* in dense heads of four or five to ten and even more. Anthers small and reniform. Borne in profusion in the axils of the leaves.

*Fruits* in dense heads, say half an inch in diameter. The common peduncle absent or very short; the pedicels always wanting. The individual fruits of the size of a peppercorn, smooth (often dotted when fresh), rim narrow, and valves always sunk.

*Bark* smooth, with the outer bark peeling off in ribbons.

*Timber* pale, nearly white.

*Hab.*—On the highest parts of the Blue Mountains.

*Affinities*.—(1) Its affinity with *E. stellulata*, Sieb., is very close, and it has been long looked upon as a variety of that species. The forms are, however, sharply separated by the broad juvenile foliage of *E. stellulata*. The mature foliage of *E. stellulata* is also, as a rule, much broader, while *E. stellulata* attains the dignity of a medium-sized tree.

(2) Its affinity to the narrow-leaved form of *E. stricta*, Sieb., has already been indicated by Bentham (B.Fl. iii. 201), and, when mature leaves are alone available, it is very difficult and perhaps

ordinarily impossible to distinguish the two species. The juvenile leaves, buds and fruits, however, sharply separate them.

It is named in honour of the late Charles Moore, for many years Director of the Botanic Gardens, Sydney.

#### 2. *E. AMYGDALINA*, Labill.

This species, as a medium-sized, elegant tree, redolent with a pleasing odour, is common on the higher parts of the Blue Mountains. Along the road we first came across it at the top of the big hill, about a mile from Lawson on the way to Wentworth Falls.

#### 3. *E. AMYGDALINA*, Labill., var. *NITIDA*, Benth.

We found this in a gully, going west from the Baptist Church at Blackheath, a small, smooth-stemmed shrub of 3 to 4 feet, adjacent to shrubs of *E. Moorei*, Maiden and Cambage. Intermediate foliage (suckers) slightly glaucous, and emitting a peppermint odour when crushed, though much less than the form of *amygdalina* common on the Blue Mountains. Opercula remarkably red, hemispherical and dotted.

Mr. Maiden has dealt with this form at some length in his 'Critical Revision,' Part vi., p.163, and announces the discovery of this variety at Mt. Victoria. Our Blackheath specimens are identical with the Mt. Victoria ones.

We now raise the question that *E. nitida*, Hook. f., (reduced to a variety of *E. amygdalina*, Labill., by Bentham) may be a valid species after all. We have not juvenile foliage in the earliest stage, but the coriaceous leaves in the intermediate stage seem to be sufficiently distinct from those of *E. amygdalina*.

#### 4. *E. REGNANS*, F.v.M.

Occurs at the foot of Govett's Leap, Blackheath, and Hassan's Walls, while it is common on basalt-capped mountains such as Mts. Tomah and Wilson.

#### 5. *E. DIVES*, Schauer.

Occurs at Mount Victoria, becomes common between Bell and Eskbank, and is plentiful around Bowenfels. Being a cold

country species, it is not found towards the eastern edge of the Blue Mountains.

6. *E. EUGENIOIDES*, Sieb.

One of the commonest species of the Blue Mountains, being found practically all over the range. It is the commonest Stringybark.

7. *E. EUGENIOIDES*, Sieb., var. *NANA*, Deane and Maiden.

Common on exposed situations, King's Tableland, Wentworth Falls.

8. *E. CAPITELLATA*, Sm.

We now draw attention to a Eucalypt from the Blue Mountains which has almost invariably gone under the name of *E. capitellata*, Sm., but which is worthy of special remark. We will proceed to describe it.

*Bark*.—Not a perfect Stringybark as compared, *e.g.*, with *macrorrhyncha*, which is more fibrous. The more fibrous bark is yellowish; close to the wood it is white. Has clean limbs, at times slightly ribbony.

Reference to the bark being not a typical Stringybark is borne out by the Mt. Wilson name, which is Messmate. At Blackheath, some years ago, Mr. H. Deane called it a peppermint bark, and suggested hybridism. On a specimen from Jenolan Caves, the collector (W. F. Blakeley) has a note:—"Bark on the lower portion of stem light reddish-brown in colour, resembling Stringybark. Upper portion grey. Branches yellowish-green."

*Timber* brownish.

*Juvenile leaves*.—The margins undulate and with a reddish rim when fresh. The leaves roughish, particularly on the lower side, owing to the presence of stellate hairs, which are also on the edges of the leaves and on the twigs.

In the intermediate stage they are *Eugenia*-like and shining on both sides, only very slightly darker on the upper side.

The branchlets are brittle and appear to be much less fibrous than those of *E. eugenioides* in the vicinity.

*Mature leaves* resemble those of typical *E. capitellata*.

*Buds.*—Clavate. Mt. Wilson specimens and others from the higher parts of the Blue Mountains show the buds rugose, after the fashion, though not so well marked, as some from Victoria.

*Flowers.*—Anthers reniform.

*Fruits* packed in a dense head; often white-dotted. In the ripe fruits valves well exerted, rather more so than in *E. macrorrhyncha*. Indeed the Rev. Dr. Woolls labelled the Mt. Wilson specimens *E. macrorrhyncha*. In that species, however, the rim remains domed in mature fruits, while in this Blue Mountain form of *E. capitellata* the rim is turned outwards till it becomes almost a continuation of the calyx.

*Hab.*—We have collected this form from Woodford to Cox's River (Bowenfels) and the Jenolan Caves, and also at Mt. Wilson. Further localities to connect with the coast will be looked for.

We have the same form on the Clyde Mountain (Southern mountain ranges), No. 31, W. Bäuerlen, July, 1890, precisely matching the Blue Mountains form.

In the Outer Domain, Sydney, we have an interesting tree which is unplanted, and which attracts attention from the fact that it is more "bark-bound" than the majority of *E. capitellata* trees around Port Jackson; that is to say, the bark, though fibrous in texture, is thinner, denser, and more closely appressed to the trunk.

The juvenile leaves and the intermediate leaves depart from the type, being narrower, more lanceolate, and more closely resemble those of the Blue Mountain form referred to at p.193.

Incidentally it may be remarked that the orbicular suckers of *E. capitellata* from type-localities (Port Jackson) would appear to be a product of an exposed situation. All the forms of *E. capitellata* appear to have more or less lanceolate juvenile leaves in their earliest stage.

Seedlings raised from typical *capitellata* trees early take on a lanceolar shape with entire margins. This is succeeded by an undulate margin, with stellate hairs on the leaves and on the irregularly toothed margin and petiole and rhachis.

These display a remarkable similarity to those of the Blue Mountains, and it seems impossible to assume other than that they belong to the same species. It would appear impossible to seize on characters even to make a well-defined variety.

Both of us have independently grown seedlings from Port Jackson and Port Hacking seed, and we cannot see any difference between these seedlings and those of the Blue Mountain trees.

#### 9. *E. MACRORRHYNCHA*, F.V.M.

At Hassan's Walls.

#### 10. *E. PIPERITA*, Sm.

This is a common tree by the roadside most of the way, but does not continue much beyond the sandstone area towards Wallerawang.

The seedlings are cordate at the base; stem-clasping, blunt, or with a short, sharp apex. They are arranged decussately and horizontally; hardly glaucous; paler on underside. Venation well marked. They have a strong peppermint perfume.

#### 11. *E. SIEBERIANA*, F.V.M.

Has a range very similar to that of *E. piperita*, and is confined to the more barren parts of the mountains.

The seedling leaves are vertically arranged; of the same colour on both sides; glaucous, and larger than those of *E. piperita*. The venation is rather acute with midrib.

#### 12. *E. CONSIDENIANA*, Maiden.

Common near the 40 mile-post (road), and the last tree observed near the road was near the western boundary of Portion 12, Parish of Linden (nearly midway between Linden and Woodford Stations).

In full flower at 10 feet high, and the only Eucalypt in full flower in the district (12th November). It is usually a tree of 30 or 40 feet. *E. piperita* was in early bud, and *E. Sieberiana* had nearly flowered off. (It has been suggested, and we concur,

that *E. Consideniana* is possibly a hybrid between the two species named).

*E. piperita* fruits in large masses or bunches, while *E. Consideniana* is a comparatively shy fruiter. The fruits resemble those of *E. Sieberiana* a good deal.

The bark of *E. Consideniana* is nearest that of *E. piperita*. In small trees, *E. Consideniana* may have bark as smooth as *piperita*, which is really quite smooth, fibrous in large trees. The Blue Mountains trees of *E. Sieberiana* have not, as a rule, the furrowed, Ironbark-looking bark of the typical form, and, speaking in general terms, the bark of *E. Consideniana* presents some resemblance also to the bark of the trees of *E. Sieberiana*, with which it is associated.

### 13. *E. STRICTA*, Sieb.

Our first specimen was observed just past Faulconbridge Station, and was 9 inches in diameter with a height of 20 feet. It is worthy of remark that the young leaves contain Caoutchouc. In favourable localities this species, usually a shrubby plant, grows taller, with fewer flowers and coarser foliage. The coarseness of the species appears to be a matter of good soil and shelter. The opercula are often red in fresh specimens.

The seedling leaves are lanceolate, erect, equally green (bright or sap-green) on both sides. The oil dots on the juvenile foliage are well marked. The young twigs are reddish, with tubercles of a darker colour.

### 14. *E. VIRGATA*, Sieb., var. *ALTIOR*, Deane & Maiden (*E. oreades*, R. T. Baker).

Found in the valleys or on the taluses of the hills from Springwood higher. Its precise range is a matter for observation.

Young seedlings remind one of those of *E. Sieberiana* a good deal. They are medium lanceolate, bluish-green, equally green on both sides. Decussate at first, after two or three pairs they lose their horizontal character. At length they are more or less undulate and pendulous.

The true affinity of this species appears to be with *E. Sieberiana*. This is shown in the seedlings, and to a less extent in the fruits and timber.

15. *E. HEMASTOMA*, Sm., var. *MICRANTHA*, Benth.

(*E. micrantha*, DC.)

This small-fruited form continues the whole way across the Mountains, and is confined to the poor soil, avoiding the deep valleys.

The seedling leaves tend to be vertical, and therefore are equally green (blue-green) on both sides. The twigs are red, as also in mature specimens. Venation less acute than in *E. Sieberiana*. Certainly as regards juvenile leaves there is a close affinity with *E. Sieberiana*.

16. *E. CREBRA*, F.V.M.

Occurs at Lapstone Hill.

17. *E. PANICULATA*, Sm.

On Lapstone Hill.

18. *E. SIDEROPHLOIA*, Benth.

Lapstone Hill.

19. *E. MELLIODORA*, A. Cunn.

In the Kanimbla Valley; also in a paddock on Jack White's Creek, half a mile from Hassan's Walls. It is, of course, common on granite country, and in the localities cited it is either on granite or where the detritus from the sandstone ridges is not thick.

20. *E. GONIOCALYX*, F.V.M.

A common tree in many of the valleys of the Blue Mountains, at least from Lawson to Bowenfels; but never continues right up on to the tableland proper. Besides the valleys, it is often found on the taluses of the hills.

21. *E. CABBAGEI*, Deane & Maiden.

Hartley to Hassan's Walls.



22. *E. DEANEI*, Maiden.

In the Blue Mountains this species is usually confined to the valleys, so that it rarely approaches within sight of the Great Western Road. It occurs abundantly, however, close to the railway line at Springwood, having followed up the gullies in the vicinity.

23. *E. RESINIFERA*, Sm.

The well-known Red or Forest Mahogany is distributed along the roadside till the vicinity of Linden is reached, after which it was not noticed. The form seen between Emu Plains and Linden was remarkable for its very short, blunt operculum, but could usually be distinguished from other trees with stringy bark by its large leaves.

24. *E. PUNCTATA*, DC.

Lapstone Hill to Springwood.

25. *E. GUNNII*, Hook. f., var. *RUBIDA*, Maiden (*E. rubida*, Deane & Maiden).

In gullies about Blackheath, Mt. Victoria, and the highest parts of the mountains. The leaves depart a little from the type. Leaves in young trees often large, drooping and undulate. With twigs of absolutely mature foliage and with the buds, as they are in threes, we doubt if anyone, in the absence of fruits (and perhaps with difficulty then) can differentiate this species from *viminalis*.

Of course with suckers the matter is perfectly easy.

26. *E. GUNNII*, Hook. f., var. *MACULOSA*, Maiden (*E. maculosa*, R. T. Baker).

First observed on the Great Western Road as one enters Katoomba. Thence forward it is a very common tree. Puzzling intermediate forms of *E. Gunnii*, Hook. f., are found at Mt. Victoria and on the western slopes of the Blue Mountains.

27. *E. VIMINALIS*, Labill.

On basalt and on sandstone at Mt. Wilson; at Hassan's Walls and thence to Cox's River; also Lowther Road, Mt. Victoria into Kanimbla Valley; also Jenolan Caves.

28. *E. CORYMBOSA*, Sm.

This common coastal species is plentiful on the Blue Mountains till the vicinity of Wentworth Falls is reached, after which the elevation, which is upwards of 3000 feet above sea-level, appears to be too great for it.

29. *E. EXIMIA*, Schauer.

Very common about Glenbrook and Blaxland, but was not observed beyond Springwood. October is the usual flowering time for this species, but the evidence available on 12th November last went to show that, with but few exceptions, it did not flower last spring; and it is worthy of note that it flowered profusely in 1900 and 1902, but was almost destitute of flowers in 1901 (*vide* these Proceedings, 1902, p 206). Many of the trees were rendered attractive in November by the display of purple foliage on the young shoots.

We now bring under notice three Eucalypts which are certainly suggestive of hybridisation. They are all rare and were found by us at Blackheath during January, 1905.

**A**.—A tree of about 25 feet, 16 inches in diameter at 2 feet from the ground.

*Juvenile leaves* ovate-lanceolate, decussate, apex somewhat blunt, slightly petiolate. No seedlings over four inches high were procurable.

*Mature leaves* bright green, rather coriaceous, veins prominent and spreading from the base; intramarginal vein at a considerable distance from the edge.

*Buds*.—Operculum conical.

*Flowers*.—Anthers reniform.

*Fruits* in umbels of up to six or eight in the head; the peduncle say  $\frac{3}{8}$  inch long, and the pedicels short, but distinct. The individual fruits somewhat pear-shaped, about a quarter of an inch in diameter, the rim somewhat domed, and the valves a little exserted.

*Bark*.—A ribbony gum. For the bottom three feet black, scaly; the rest of the tree smooth-barked, thin and ribbony.

*Timber* pale-coloured, full of gum veins and very inferior.

*Affinities*.—We have no doubt that this tree is closely allied to *E. stricta*, Sieb., or that *E. stricta* is a parent. Its foliage and buds resemble those of *E. stricta*; its bark in the upper part resembles that of *E. stricta*, while where it is toning off from the lower it reminds one of that of *E. piperita*, Sm. Its fruits differ from those of both species, while both have sunken valves as a rule. The fruits, as regards their domed shape, remind one of those of *E. Gunnii*, Hook. f., var. *maculosa*, somewhat.

It is expected that juvenile foliage will throw light upon its affinities, and until these are available it is desirable to reserve judgment.

On the Medlow Road, left hand side, a few hundred yards from last house at Blackheath.

**B**—Forms a small clump of about 10 saplings, perhaps from the same root. They are 10 feet high, and the stems are 2-2½ inches in diameter. Very strict in habit.

*Juvenile leaves* narrow-lanceolate, broadening while still in the opposite stage, decussate, apex rather blunt, petiole very short, almost stem-clasping. These leaves certainly remind one of those of *E. stricta*, Sieb.

*Mature leaves* lanceolate or narrow-lanceolate, thick, in most specimens the venation not prominent, the few veins seen spreading from the base. They bear some resemblance to those of Sieber's Fl. Nov. Holl. No. 472 (type of *E. stricta*, Sieb.).

*Buds* rather clavate. Operculum nearly conical and red.

*Flowers* nearly capitate, and up to 18 in the head.

*Fruits* subcylindrical or truncate-ovoid. Common peduncle say  $\frac{1}{4}$  inch long, the pedicels distinct, but very short. Edge sharp, rim distinct and tapering inwards. Valves quite included. Intermediate in size between those of *E. stricta*, Sieb., and *E. Moorei*.

*Bark* smooth, white, slightly ribbony.

*Timber* pale.

*Affinities*.—Occurs amidst clumps of *E. Moorei*, Maiden and Cabbage, and near masses of *E. stricta*, Sieb. We cannot but regard it as strongly suggestive of a hybrid of both these species; certainly it appears to be intermediate between these two species, with a leaning towards the former, from which its most obvious difference is its larger fruits and broader seedling leaves.

Short of seeing the actual plants and specimens, carefully executed illustrations can alone make their characters clear.

C—A sapling tree, say 4 inches in diameter and 12 feet high. One small clump also seen.

*Juvenile leaves*.—Not seen in the earliest stage, but in what may be termed the intermediate stage. In that stage they are oval or oblong, and say  $1\frac{1}{2}$  inch long by  $\frac{1}{2}$  inch broad and profusely dotted with oil glands.

*Mature leaves* bright green, rather coriaceous. Veins fairly prominent, and spreading from the base; intramarginal vein a considerable distance from the edge. Tips of the leaves hooked as a rule. Reminds one of foliage of *E. stricta*, amongst which it grows, though the venation is probably more prominent than that of *E. stricta*.

*Buds* numerous, pointed, and in heads, giving it a stellate aspect. Hardly so clavate as those of *E. stricta*, but not seen ripe. Four to ten in the umbel.

*Flowers*.—Expanded ones not seen.

*Fruits* in dense heads, the common peduncle up to a quarter of an inch, pedicels absent. Individual fruits rarely hemispherical, slightly compressed at the base, rim broad and reddish-brown, slightly domed, tips of valves flush with the orifice.

*Bark* smooth, very long ribbons.

*Timber* pale-coloured.

*Affinities*.—The surrounding species are *E. stricta*, Sieb., *E. Sieberiana*, F.v.M., *E. Moorei*, Maiden and Cabbage, and *E. Gunnii*, Hook. f., var. *maculosa*, Maiden (*E. maculosa*, R. T. Baker). It has already been pointed out that the foliage resembles that of *E. stricta*. The buds exhibit slight resemblances at least to *E. stricta* and to *E. Gunnii*, var. *maculosa*, particularly to the former, but the affinity of the fruits is not at present obvious, though they are suggestive of some forms of both *E. capitellata* and *E. eugenioides*, to which trees our plant has otherwise not the slightest resemblance; and it may turn out to be a good species.